ATOMIC ENERGY newsletter

THE FIRST AND ONLY ATOMIC NEWS SERVICE

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Dear Sir:

Charges of serious and unnecessary delays in the U. S. atomic energy program were made last week by Dr. Kenneth S. Pitzer, director of research for the USAEC from January 1949 to June 1951. Addressing the southern California section of the American Chemical Society, Dr. Pitzer asked for an overhauling of the USAEC's basic rules of procedure to reduce the authority of its scientific advisers, and put more dependence on laboratory directors and USAEC project engineers. He asked that Commission advisers "who have remarkably little enthusiasm for the primary goals of the USAEC" be replaced by men "with faith and enthusiasm in the job to be done", and who would give the Commission "constructive advice". What are needed, Dr. Pitzer asserted, are men who will specialize in pointing out new fields to explore rather than in double-checking decisions in projects already under way. On the General Advisory Committee, he singled out Dr. James B. Conant, as one who has little hope for useful atomic power, and as being on record as stating that in the Nineteen-Sixties the effort in that direction will be abandoned. There are other members of the Committee who have expressed similar opinions, he stated. He would have them replaced by men of comparable stature who are on record as believing great new developments in atomic energy are possible. Such men of vision and constructive ideas include (Dr. Pitzer stated) Dr. Harold C. Urey, the Nobel laureate; Dr. Farrington Daniels, president-elect of the American Chemical Society; and Dr. Charles Thomas, president of Monsanto Chemical Co.

The U. S. Atomic Energy Commission is "reasonably efficient by general government standards" Dr. Pitzer continued, but he pointed out that the country had a right to expect "something special in this vital area".

It is in the reactor development program that there have been the most serious delays, Dr. Pitzer observed. Certainly, he stated, after the successful reactors had been built at Hanford Plutonium Works, the further job of building a reactor to produce electric energy was no more difficult. Yet it was not until December, 1951, or more than 6 years after the end of World War II, that an atomic reactor on the USAEC's testing ground at Argo, Idaho, produced 100 kilowatts of electrical energy. This slowness did not arise from lack of designs for power reactors which reputable scientists and engineers were willing to build and test. It came instead from an unwillingness on the part of the USAEC to proceed with any one of these designs until all of the advisers agreed that this was the best design. Dr. Pitzer contended that cautiousness reaching sometimes "silly extremes" had held up the reactor program until the Idaho proving ground could be procured. He said that safer and smaller models could have been built without any significant risk on the original Argonne and Oak Ridge, Tenn., sites with great savings in both time and money.

Orders totaling approximately $11,000,000 have been received by Westinghouse Electric Corp. to build equipment necessary for generating, carrying, and using electric power at the Savannah River Project of the USAEC.

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WHERE ARE WE GOING IN ATOMIC ENERGY? A special digest of remarks by Gordon Dean, Chairman, USAEC, before the Economic Club of Detroit, Mich., Mar. 3rd, 1952.

Before we attempt to look into the future, let's see where we are now. As of today, the U.S. has a $6 billion investment in atomic energy. The largest share of these billions has been spent on facilities for weapon production. But in this military effort, we have achieved peaceful gains. These gains are the 130,000 people now in the program, as well as the half-million others who have at one time or another been in it since 1943; the great body of knowledge we have built up on the subject; and the physical assets--the plants, warehouses, ore buying stations, etc. Of course, there are the research laboratories, too. Another asset is the fissionable material now stored in the form of weapons. While it's an explosive, as a fuel for peaceful uses its BTU content per unit of volume is millions of times greater than other fuels.

Now let's look at where we are going. Our first objective is to increase our stockpile of fissionable material. That's why we are now engaged in a $2½ billion expansion, and why the President has said he will shortly ask Congress to authorize another expansion--this time to the tune of some $5 billion. It salso why we recently increased our buying price for domestic uranium ore, and why we recently entered into an agreement with the Union of South Africa to buy uranium recovered from the Union's gold slimes.

Our second objective is to develop new and better weapons. These are being tested, and that is why there have been so many weapons tests in Eniwetok and Nevada and why there has been such a great atmosphere of urgency about them.

The third objective is to develop a hydrogen bomb. This work, too, is related to our stockpiling of fissionable material, since if explosive energy can be obtained from the fusion of hydrogen, then a corresponding quantity of fissionable material can be saved.

Our fourth major objective is to develop reactors for the production of heat which can be used to produce electric power. If the cold war were to end tomorrow, this would be our main objective; now, however, it must take a back seat. Nevertheless, it is an important objective, we think, and we are attempting to achieve it in two ways:

(1) From our military work we try to get all we can put to use for this purpose. It is knowledge: about reactors, about nuclear physics, about chemical processing, about the nature of radioactivity, and about materials. This helps compensate, somewhat, for the priority assigned to weapons.

(2) This attack has also been strongly influenced by the times. Our main immediate practical goal is not to build a reactor that will produce power to light a city--it is instead to build a reactor that will produce power to propel a submarine. But in doing so we are at least advancing ourselves in the attempt to produce commercial civilian power. In this light, it is actually fortunate that the Navy wants an atomic powered submarine, since otherwise a power producing reactor would be shelved, right now.

I think the best way to describe the status of our progress today is to say that reactor technology has reached a point where we can build reactors to produce power, but we don't as yet know how to build them to produce this power economically. This is why we can build a reactor to propel a submarine--where low costs are not so important--and yet cannot build one to produce power to put on the market--where costs are the controlling factor.

Although the day of economic power from fission is not around the corner, there are some markers to show progress in this direction. There will be the successful operation of a submarine reactor. Then, there will be the production of power at a competitive price with the aid of the weapons market for the plutonium that is produced simultaneously. All of these are significant. Beyond them, however, the future of atomic power will be governed largely by such economic forces as the relative value of coal and oil in specific areas, and the relative value of atomic power for use in different industries. All we have control over is the rate of progress in reactor technology, and we are pushing this as hard as we can.

BOOKS & OTHER PUBLICATIONS...in the nuclear field...

Radiocarbon Dating, by Willard F. Libby, University of Chicago. The first description of techniques for determination of the age of artifacts by measurement of radioactive carbon.--University of Chicago Press, Chicago, Ill.

Handbook for Uranium Prospectors. Revised edition of this pocket-sized handbook. Additions include latest official uranium buying prices, as well as eight color reproductions of common uranium bearing ores. Prepared by the USAEC and the U. S. Geological Survey.--Superintendent of Documents, Washington 25, D.C. (45¢)

How To Make An Atomic Bomb in Your Own Kitchen, by Bob Bale. A simplified explanation of atomic energy for the lay reader. 191 pages.--Frederick Fell, Inc., New York 16, N.Y.

Notes: "The Atom Provides a New Industrial Tool" is an 8-page brochure describing some of the possible uses of radioisotope techniques as applied to problems of production, development, and research in industry. The brochure may be obtained, without charge, from the Industrial Division of Nuclear Research & Development, Inc., 1094 Sutter Ave., St. Louis 5, Mo. The firm, consultants in nuclear physics, who have prepared this leaflet, point out that radioisotope techniques offer almost unlimited possibilities in the fields of chemistry, metallurgy, biology, etc., as well as specific applications in practically every phase of industry.

"Instrumentation for Isotope Utilization", by J. L. Kuranz, Nuclear Instrument and Chemical Corp., Chicago 10, Ill., is available, without charge, from that firm. This 8-page leaflet, a reprint of material which appeared originally in "Industrial Laboratories" for October, 1951, will be found of use to those contemplating the setting up of radioisotope laboratories.

BUSINESS BRIEFS...of nuclear energy activities...

FISSION PRODUCTS- Figures used in the Stanford Research Institute report on industrial uses for radioactive fission products (sponsored by the USAEC), purporting to show that present antibiotic sterilization costs run from 5 to 14 times the cost of sterilization with fission products, have now been questioned by pharmaceutical manufacturers. Actually, the reverse is true, industry spokesmen stated, during the recent symposium in Washington on radiation sterilization of antibiotics and pharmaceuticals. The meeting, attended by some 125 representatives of industry, government, and private research, agreed there was need for continued research to seek out the potentialities of fission products for sterilization. The pharmaceutical manufacturer's attitude toward replacement of existing sterilization methods by use of fission products was that the cost of fission products for that purpose was too high, and that research is not sufficiently advanced. They steered clear of a suggestion by Stanford Research Institute that the drug industry contribute $100,000 to continue research in this field.

Industry spokesmen expressed the view that government should be responsible for initial research and should not expect heavy contributions from industry until more definite facts can be presented. They pointed out that the primary urge for research stems from the fact that the USAEC's program necessarily results in the residue of waste products which the USAEC very naturally wants to divert to usable fields. Therefore, the USAEC should take the lead in finding uses for the products, they argued. The discussion brought out that the use of fission products causes changes in color of ampules and of antibiotic products themselves. Henry Welch, director of the Food and Drug Administration division of antibiotics said the FDA would have no objection to the use of radiation sterilization if it can be shown that the process does not significantly affect the stability, efficacy, or toxicity of drugs.

PLANT EXPANSION- Additional space, acquired by Nuclear Instrument and Chemical Corp., Chicago, has now enabled that firm to enlarge its plant area 20%. The expansion has given Nuclear's production and technical divisions additional laboratory and production facilities. The firm has disclosed that the expansion was made necessary by the increased business it is doing (in nuclear instruments and biosynthesized radiochemicals) with its industrial, medical and educational customers.

RAW MATERIALS...radioactive minerals & other needs for nuclear work...

UNITED STATES- Boise, Idaho: A new entrant in the race for monazite wealth from the sands of the Cascade area of Idaho is the Gem Monazite Mines, Inc. The company, headed by men with previous experience in Idaho mining operations, has some 1,000 acres of leases on what they consider some of the most promising monazite lands along Clear Creek, 8 miles south of Cascade, Idaho; the land is also close by a highway, permitting good access to it. (Largest U.S. purchaser of monazite sands is Lindsay Light & Chemical Corp., Chicago, rare earths processor, a large part of whose output of thorium, obtained from the monazite, is sold to the USAEC.)

New York, N.Y. - Uranium was a major topic of interest at the annual convention of the American Institute of Mining and Metallurgical Engineers, held here last fortnight. Principal points brought out were: (1) Prospecting for it is widening and it is being discovered in many new areas of the United States. (2) It is a valuable commodity, ranking in the precious metal class. (3) The USAEC wants more uranium from every possible source. At the present time the U. S. is the second largest producer of uranium ranking after the Belgian Congo. (No figures are available from the Soviet Union or its controlled satellite countries.) The major source of ore in the U.S. is the Colorado Plateau, extending over a wide area of Colorado, New Mexico, Utah, and Arizona. But a number of new discoveries in the last two years indicates that uranium also exists in many other parts of the country. Companies involved in the uranium business include Anaconda Copper, Climax Uranium, Vanadium Corp., Vitro Chemical, American Metal Company, etc. In addition, companies such as Homestake Mining, St. Joseph Lead, Newmont Mining, and American Smelting & Refining are said to be showing interest in this industry. The value of uranium is evident from the amounts of money realized by many small miners who have found it. Some of these individuals are making from $10-40,000 a year from their discoveries, according to reports. Ores from the Colorado Plateau bring from 29¢ to 61¢ for an ounce of contained uranium oxide, compared with 88¢ for silver. The average grade of ore there gives about 0.25% uranium oxide, or about five pounds for every ton of uranium ore mined.

NEW PRODUCTS, PROCESSES, & INSTRUMENTS...for nuclear work...

FROM THE MANUFACTURERS-Model 107 "Professional" is a new Geiger counter designed primarily for civil defense purposes. The model 107 has a three range meter, a neon flasher and earphones as means of indication. It has ranges of 0.2, 2.0, and 20 mr/hr full scale, and is said to be accurate within 10% of all ranges. A calibration control is provided on the top panel, and a calibrated radioactive sample is supplied making it possible to calibrate the instrument in the field. The Geiger tube is contained in a directional probe with a sliding shield for discriminating between betas and gammas. Size: 4"x4½"x6½"; weight: about 5-lbs. The instrument is also available with a mica end window tube which enables it to detect alpha particles as low as 2 MEV and beta particles as low as 0.015 MEV.--Precision Radiation Instruments, Los Angeles 15, Calif.

NOTES - Faster and more accurate gamma ray logging of drill holes, an important metod of exploring for uranium beneath the earth's surface, is now said to be possible through the development of a new scintillation probe and detecting circuit. The device was designed by Hugo J. DiGiovanni, Robert T. Graveson, and Alfred H. Yoli, engineers of the Electronics Section, in the USAEC's New York Operations' instruments branch. The probes and detecting circuits were fabricated in the instruments shop, of this office, under the supervision of Jack Blume. The apparatus has been successfully tested by USAEC geophysicists in a series of test holes as deep as 200 feet near Blandings, Utah. Several motor veicles are now to be equipped with the apparatus, for USAEC full-scale field use; it is expected that this will speed up exploration considerably. Essentially, the new probe consists of a light-tight, hollow, stainless steel cylinder, 2½-feet long, having an outside diameter of 2-inches, in which a special crystal of sodium iodide is placed next to a photomultiplier tube. Advantages of scintillation devices, over Geiger tube probes are: Greater efficiency; more precise location of the source emitting the radiation; faster logging with equal and better statistical accuracy; discrimination between Gamma rays of different energies; and greater versatility.

ATOMIC PATENT DIGEST...latest U. S. applications & grants...

Method of determining the isotopic composition of an element capable of being incorporated in a uranyl element. Comprises chemically incorporating the element in a uranyl compound to enhance the separation of corresponding spectral lines characteristic of the isotopes of the element, producing a spectrum, and scanning the spectrum with a light sensitive tube. U. S. Pat. No. 2,585,901 issued Feb. 19, 1952; assigned to United States of America (USAEC).

Apparatus for melting metal. Comprises a chamber, a rotatable shaft in this chamber, a rotor fixed to the shaft and so positioned in the chamber that it receives and retains metal to be melted in at least two opposed molds to maintain the rotor in balance, induction heating means surrounding the chamber, and means for evacuating the chamber. U. S. Pat. No. 2,586,027 issued Feb. 19, 1952; assigned to United States of America (USAEC).

Method of preparing a solid high molecular weight polymer. Comprises polymerizing a halogen-substituted olefin having two carbon atoms in the presence of a completely halogen substituted acetyl peroxide at a sufficiently low temperature to regulate the decomposition of the peroxide. U. S. Pat. No. 2,586,550 issued Feb. 19, 1952; assigned to United States of America (USAEC).

Apparatus for regulating a flow of gas. Comprises a hollow metal tube, an element in the tube for providing a relatively small gas conducting channel with pivoting jaws, to contact the tubing and provide regulation of the flow. U. S. Pat. No. 2,586,984 issued Feb. 26, 1952; assigned to United States of America (USAEC).

Indicating pocket ionization chamber. An ionization chamber having at least two electrodes insulated from each other and arranged to be charged to a potential difference. One of the electrodes is arranged for swinging movement, with means for moving it to decrease the effective volume of the chamber upon a decrease in potential difference between the electrodes. U. S. Pat. No. 2,587,254 issued Feb. 26, 1952 to John A. Victoreen, Cleveland, O., assignor to Victoreen Instrument Co., Cleveland.

Recovering concentrates of vanadium and/or uranium from acid, aqueous solutions having low concentrations of dissolved compounds of uranium and vanadium, and high concentrations of other metallic compounds of iron and aluminum. Comprises converting to the bivalent state the ferric iron present, and any pentavalent uranium to the quadrivalent state, thereafter adding to the solution a base in a quantity to precipitate only as much ferrous hydroxide as is precipitated by the time all the uranium and vanadium is completely precipitated, and recoving the vanadium and uranium compounds. U. S. Pat. No. 2,587,286 issued Feb. 26, 1952 to Nils H. Hoganas, Sweden, assignor to Ekstrand & Tholand, Inc., New York, N. Y.

Process of producing uranium pentachloride. A method of producing uranium pentachloride through the reaction of chlorine with certain halides of uranium. U. S. Pat. Application No. 506,336 filed Oct. 15, 1943; published Feb. 26, 1952. Assigned to United States of America (USAEC).

Electrodeposition of a heavy metal-containing material. A process for the electrodeposition of a material containing neptunium from aqueous solutions. U. S. Pat. Application No. 25,076 filed May 4, 1948; published Feb. 26, 1952. Assigned to United States of America.

Electrical neutronic reactor simulator comprising a high gain integrator amplifier having an input signal and an output signal, with the output signal representative of the neutron density of a neutronic reactor. U. S. Pat. No. 2,587,919 issued Mar. 4, 1952; assigned to United States of America (USAEC).

Separation of metal values in fluoride compositions. Method of recovering the valuable components of a solid sludge which contains potassium, nickel, iron and fluorine values, and which is produced in the electrolysis of acid potassium fluoride when using nickel anodes in steel electrolytic chambers. U. S. Pat. No. 2,588,041 issued Mar. 4, 1952; assigned to United States of America (USAEC).

Sincerely,

The Staff
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